

ID 139410

139410

Page 1

er 27, 2015 3:19:26 PM

D6024-103

Accept

N900040100

Setup Start *NS1*

Stop *NS2*

D:

Item Name: Crosstube Material

Start Date: 11/27/2015 Start Qty: 44.00

Required Date: 4/29/2016 Req'd Qty: 44.00

44

44

Cust Item ID:

Customer:

Reference:

Approvals: Process Plan: WLS Date: 11-11-30 Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start *NR1*

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr	Revision Nbr
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D6024	A
-------	---

100

0.00

100

Purchasing

Purchasing

PURCHASING

Memo

Issue P/O

30644

0.00

CL DEC 03 2015 44

a) Extrude as per Dwg D6024

b) Material: 7075-T6/T6511 (WW-T-700/7 or QQ-A-225/9 or QQ-A-200/11)
seamless aluminum tube

c) Minimum ultimate tensile strength = 77 ksi

d) Minimum tensile yield strength = 66 ksi

e) Material certification is required

***EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE
SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH
AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS,
OR DENTS.***

MUST BE WELL PACKAGE, IF NOT IT WILL BE REFUSE

DQA: _____ Date: _____

WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date : _____	Step #: _____	QTY Effective : _____		MRB (QSI042) Approval	
Description Work Order Deviation			Disposition		
			Completed By		
			Lead hand / Supervisor Approval Verification		
			QC / QA Coordinator Approval		
Root Cause		FAULT CATEGORY			
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐	Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐	Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐
OTHER : ☐					

Work Order ID 139410

Friday, November 27, 2015 3:19:26 PM

139410

Page 2

Item ID: D6024-103 Accept ***N900040100*** Setup Start ***NS1***
Revision ID: Stop ***NS2***
Item Name: Crosstube Material
Start Date: 11/27/2015 Start Qty: 44.00 ***44*** Cust Item ID:
Required Date: 4/29/2016 Req'd Qty: 44.00 ***44*** Customer:
Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
110	Receive & Inspect for Damage & Mat'l Certs	0.00							
110									
Packaging	Memo	0.01							
Packaging	Ensure material certification is attached								
120	QC- Inspect dimensions to drawing	0.00							
120									
QC	Memo	0.00							
Quality Control	Ensure Material certification comply to Dwg D6024								
140	Identify as per dwg & Stock Location: <u>LG003</u>	0.00							
140									
Packaging	Memo	0.01							
Packaging	LOCATION : LG003								

45x 80/6-04-28

DAS
16
9-89

206/05/03

Pto →

4/5

mmml
16/05/03

DQA: _____ Date: _____

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: _____ Date: _____

Work Order update only



Work Order: <u>139410</u> Part No. <u>D6024-103</u> NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS <table style="width:100%; font-size: small;"> <tr> <td>Skid-tube ☐</td> <td>Cross tube ☐</td> <td>Water Jet ☐</td> <td>Engineering ☐</td> </tr> <tr> <td>Machining ☐</td> <td>Small Fab ☐</td> <td>Prod. Eng. Coord. ☐</td> <td>Quality ☐</td> </tr> <tr> <td>Thermoforming ☐</td> <td>Finishing ☐</td> <td>Rec/Store/Packaging ☐</td> <td>Other ☐</td> </tr> <tr> <td>Large Fab ☐</td> <td>Composite ☐</td> <td>Supplier ☐</td> <td></td> </tr> </table>				Skid-tube ☐	Cross tube ☐	Water Jet ☐	Engineering ☐	Machining ☐	Small Fab ☐	Prod. Eng. Coord. ☐	Quality ☐	Thermoforming ☐	Finishing ☐	Rec/Store/Packaging ☐	Other ☐	Large Fab ☐	Composite ☐	Supplier ☐																																																												
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Date : <u>20c604/28</u>	Step #: <u>120</u>	QTY Effective : _____	MRB (QSI042) Approval DAS <u>16</u> 9-89 <u>16/04/28</u>																																																																													
Description Work Order Deviation		Disposition																																																																														
<u>change step #120 to QC18 inspection</u>		<u>8</u>																																																																														
		Completed By DAS <u>10</u> 9-89 <u>16.05.04</u> Lead hand / Supervisor Approval Verification QC / QA Coordinator DAS Approval DAS <u>16</u> 9-89 <u>16/04/28</u>																																																																														
<table style="width:100%; font-size: x-small;"> <tr> <th colspan="4" style="text-align: left;">Root Cause</th> <th colspan="4" style="text-align: left;">FAULT CATEGORY</th> </tr> <tr> <td style="width:15%;">Environment ☐</td> <td style="width:15%;">No Re-verification ☐</td> <td style="width:15%;">Pressure/Forced ☐</td> <td style="width:15%;">Temperature/Cure ☐</td> <td style="width:15%;">Power Loss/Surge ☐</td> <td style="width:15%;">Positioned Wrong ☐</td> </tr> <tr> <td>Design ☐</td> <td>Operator ☐</td> <td>Bending ☐</td> <td>Set-up ☐</td> <td>Folio/Program ☐</td> <td>Outside Dimensions ☐</td> </tr> <tr> <td>Doc/Data ☐</td> <td>Offset/Setup ☐</td> <td>Centre Not Concentric ☐</td> <td>BOM/Route ☐</td> <td>Grain ☐</td> <td>Over/Under tolerance ☐</td> </tr> <tr> <td>Equip/Tooling ☐</td> <td>Supplier ☐</td> <td>Cracks ☐</td> <td>Broken/Damage/Defect ☐</td> <td>Weld ☐</td> <td>Part Incorrect ☐</td> </tr> <tr> <td>Handling/Pre ☐</td> <td>Training ☐</td> <td>Crimp/Kink/Ripple/Wave ☐</td> <td>Inspection Incomplete/Unqualified ☐</td> <td>Wrong Stock Pulled ☐</td> <td>Part Lost/Missing ☐</td> </tr> <tr> <td>Material ☐</td> <td>Use for Testing ☐</td> <td>Cuffs ☐</td> <td>Contamination ☐</td> <td>Out of Sequence ☐</td> <td>Part Moved ☐</td> </tr> <tr> <td>Internal Transport ☐</td> <td>Poor Information ☐</td> <td>Crushing ☐</td> <td>Countersink ☐</td> <td>Off-set ☐</td> <td>Drawing ☐</td> </tr> <tr> <td>Tribal Knowledge ☐</td> <td>Rushing ☐</td> <td>Heat Treat ☐</td> <td>Cut Too Short ☐</td> <td>Mislabeled ☐</td> <td>Finish ☐</td> </tr> <tr> <td>LOA ☐</td> <td>Product Improvement ☐</td> <td>Wave/Twist in Tube ☐</td> <td>Instructions Incomplete/Unclear ☐</td> <td>Fit/Function ☐</td> <td>Misread ☐</td> </tr> <tr> <td>Substation ☐</td> <td>Process Improvement ☐</td> <td>Marks/Chatter ☐</td> <td>Drill Holes ☐</td> <td>Misaligned/off center ☐</td> <td>Turning Sequence ☐</td> </tr> <tr> <td>Past Expiry Date ☐</td> <td>Manufacturing Process ☐</td> <td colspan="4" rowspan="2" style="vertical-align: top;">OTHER : _____</td> </tr> <tr> <td>Misidentified ☐</td> <td>Past Due ☐</td> </tr> </table>					Root Cause				FAULT CATEGORY				Environment ☐	No Re-verification ☐	Pressure/Forced ☐	Temperature/Cure ☐	Power Loss/Surge ☐	Positioned Wrong ☐	Design ☐	Operator ☐	Bending ☐	Set-up ☐	Folio/Program ☐	Outside Dimensions ☐	Doc/Data ☐	Offset/Setup ☐	Centre Not Concentric ☐	BOM/Route ☐	Grain ☐	Over/Under tolerance ☐	Equip/Tooling ☐	Supplier ☐	Cracks ☐	Broken/Damage/Defect ☐	Weld ☐	Part Incorrect ☐	Handling/Pre ☐	Training ☐	Crimp/Kink/Ripple/Wave ☐	Inspection Incomplete/Unqualified ☐	Wrong Stock Pulled ☐	Part Lost/Missing ☐	Material ☐	Use for Testing ☐	Cuffs ☐	Contamination ☐	Out of Sequence ☐	Part Moved ☐	Internal Transport ☐	Poor Information ☐	Crushing ☐	Countersink ☐	Off-set ☐	Drawing ☐	Tribal Knowledge ☐	Rushing ☐	Heat Treat ☐	Cut Too Short ☐	Mislabeled ☐	Finish ☐	LOA ☐	Product Improvement ☐	Wave/Twist in Tube ☐	Instructions Incomplete/Unclear ☐	Fit/Function ☐	Misread ☐	Substation ☐	Process Improvement ☐	Marks/Chatter ☐	Drill Holes ☐	Misaligned/off center ☐	Turning Sequence ☐	Past Expiry Date ☐	Manufacturing Process ☐	OTHER : _____				Misidentified ☐	Past Due ☐
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Work Order ID 139410***139410***

Page 3

Friday, November 27, 2015 3:19:26 PM

Item ID: D6024-103

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Crosstube Material

Start Date: 11/27/2015 Start Qty: 44.00

44

Cust Item ID:

Required Date: 4/29/2016 Req'd Qty: 44.00

44

Customer:

Reference:

Run Start ***NR1***

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop ***NR2***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID Tool # Plan Code Accept Qty Reject Qty Reject Number Insp. Stamp

150

QC21- Final Inspection - Work Order Release

0.00

150

QC

Memo

0.07

Quality Control

MCS MAY 03 2016

Zm 16/05/03

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date : _____	Step #: _____	QTY Effective : _____		MRB (QSI042) Approval	
Description Work Order Deviation			Disposition		
			Completed By		
			Lead hand / Supervisor Approval Verification		
			QC / QA Coordinator Approval		
Root Cause		FAULT CATEGORY			
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐	No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐	Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Misabeled ☐ Fit/Function ☐ Misaligned/off center ☐	Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐
☐ OTHER : _____					

Picklist Print

Friday, November 27, 2015 3:19:30 PM

Page 1

Work Order ID: 139410

139410

Parent Item: D6024-103

D6024-103

Parent Item Name: Crosstube Material

Start Date: 11/27/2015

Required Date: 4/29/2016

Start Qty: 44.00

Required Qty: 44.00

Comments: IPP REV:A 15.11.09 NEW ISSUE DD VERF:JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6024-103P		Purchased		No			Each	0.0000		44	45		
D6024-103P									**				
Crosstube Material													

45
45x SP/6-04-28

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

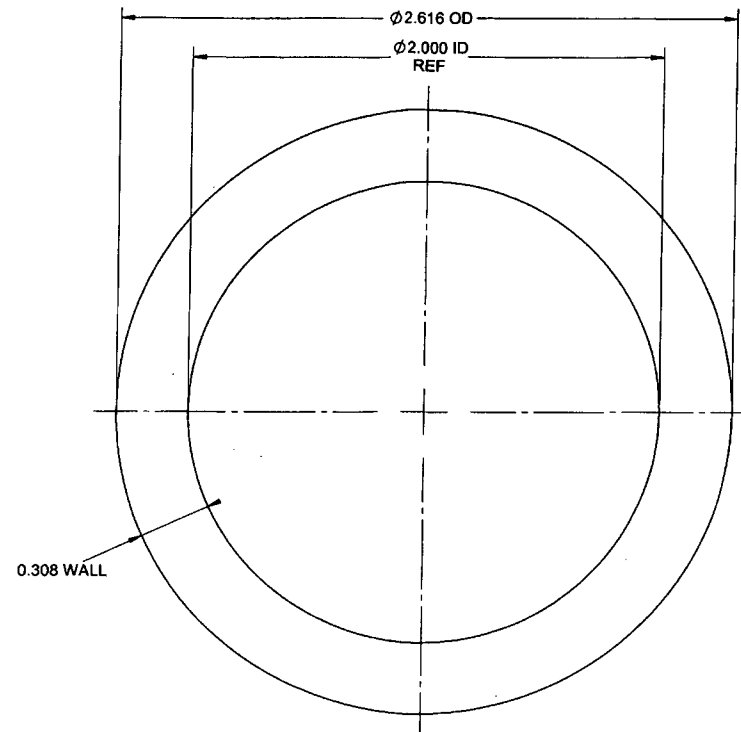
QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
Date :		Step #:		QTY Effective :			MRB (QSI042) Approval Completed By Lead hand / Supervisor Approval Verification QC / QA Coordinator Approval		
Description Work Order Deviation				Disposition					

Root Cause				FAULT CATEGORY			
Environment ☐	☐	No Re-verification	☐	Pressure/Forced	☐	Temperature/Cure	☐
Design ☐	☐	Operator	☐	Bending	☐	Set-up	☐
Doc/Data ☐	☐	Offset/Setup	☐	Centre Not Concentric	☐	BOM/Route	☐
Equip/Tooling ☐	☐	Supplier	☐	Cracks	☐	Broken/Damage/Defect	☐
Handling/Pre ☐	☐	Training	☐	Crimp/Kink/Ripple/Wave	☐	Inspection Incomplete/Unqualified	☐
Material ☐	☐	Use for Testing	☐	Cuffs	☐	Contamination	☐
Internal Transport ☐	☐	Poor Information	☐	Crushing	☐	Countersink	☐
Tribal Knowledge ☐	☐	Rushing	☐	Heat Treat	☐	Cut Too Short	☐
LOA ☐	☐	Product Improvement	☐	Wave/Twist in Tube	☐	Instructions Incomplete/Unclear	☐
Substation ☐	☐	Process Improvement	☐	Marks/Chatter	☐	Drill Holes	☐
Past Expiry Date ☐	☐	Manufacturing Process	☐	OTHER : _____			
Misidentified ☐	☐	Past Due	☐				

SPECIFICATION CONTROL DRAWING



D6024-XXX CROSSTUBE MATERIAL

WHERE XXX IS LENGTH IN INCHES
EG. 103" LONG TUBE: D6024-103

NOTES:

- 1) MATERIAL: 2.616 OD X 0.308 WALL 7075-T6/T6511 (WW-T-700/7 OR QQ-A-225/9 OR QQ-A-200/11) SEAMLESS ALUMINUM TUBE.
MINIMUM ULTIMATE TENSILE STRENGTH = 77 KSI
MINIMUM YIELD TENSILE STRENGTH = 66 KSI
- 2) FINISH: NONE
- 3) TOLERANCES: PER ASTM B210 AS FOLLOWS:
O.D.: +/- 0.008 MEAN (+/- 0.016 INCLUDING OVALITY)
WALL: +/- 0.011 MEAN (+/- 0.031 INCLUDING ECCENTRICITY)
LENGTH: XXX +/- 0.188/-0.000
STRAIGHTNESS: 0.010" DEVIATION / 12" LENGTH
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: N/A
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: N/A
- 8) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

RELEASED
2015-11-04
EW 5-62

APPROVED

A		NEW ISSUE		AP	15.10.13
REV.	DESCRIPTION			BY	DATE
DESIGN	AP	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA			
DRAWN	AP				
CHECKED	AJS	DRAWING NO.	REV. A		
MFG. APPR.	JLM	D6024	SHEET 1 OF 1		
APPROVED	WM	TITLE	SCALE		
DE APPR.	DS	CROSSTUBE MATERIAL	NTS		
DATE	15.10.13	COPYRIGHT © 2015 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL, AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE REPRODUCED OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.			

139410 MJS
15-11-30

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date : _____	Step #: _____	QTY Effective : _____		MRB (QS1042) Approval	
Description Work Order Deviation			Disposition		
			Completed By		
			Lead hand / Supervisor Approval Verification		
			QC / QA Coordinator Approval		
Root Cause Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐		FAULT CATEGORY Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabelled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐			
☐ OTHER : _____					

order confirmation

59326

page: 5
date: 1.06.2016
customer: 40980

inspection cert. acc. to EN10204/3.1 / RM 469 / Rp0,2: 393
straightness 0,01 INCH / 1 FEET / RMS max.: outer 25
tol. on quantity +10 % -10 %
3.750" OD 0.375" Wall, 90" lengths
Part Number D6014-090 skidtube
Tolerances per ASTM B210
Outside surface: max. defects up to 0.005" (longitudinally)
Tubes protected with corrosion protective oil
Tubes line marked
Packing: seaworthy wooden cases

item	quantity	unitprice	USD	unit value	USD	delivery
800	23,000	PC	749,00	PC	17.227,00	May 02, 2016

AWU article: 50631 / Tariff no. 76082081
Customer article: D6023-106P
product: Tubes / seamless extruded / EN AW-7075 / round
condition: T 6511 / AMS-QQ-A-200/11(A)

outer diameter:	3,200 INCH Tol.	+0,016	-0,016
tol. for mean OD		+0,008	-0,008
inner diameter:	2,250 INCH		
wall thickness:	0,475 INCH Tol.	+0,047	-0,047
fixed length	106,000 INCH Tol.	+0,125	

inspection cert. acc. to EN10204/3.1 / RM 531 / Rp0,2: 455
straightness 0,01 INCH / 1 FEET / RMS max.: outer 25
tol. on quantity +15 % -15 % / with packing list / scurfed
3.200" OD 0.475" Wall, 106" lengths
Part Number D6023-106P crosstube
Surface Finish max. RMS 25
Tolerances per ASTM B210 / drawing D6023
Tubes protected with corrosion protective oil
Tubes line marked

Packing: seaworthy wooden cases

item	quantity	unitprice	USD	unit value	USD	delivery
900	44,000	PC	374,00	PC	16.456,00	May 02, 2016

AWU article: 50632 / Tariff no. 76082081
Customer article: D6024-103P
product: Tubes / seamless extruded / EN AW-7075 / round
condition: T 6511 / AMS-QQ-A-200/11(A)

outer diameter:	2,600 INCH Tol.	+0,012	-0,012
tol. for mean OD		+0,006	-0,006
inner diameter:	2,000 INCH		
wall thickness:	0,300 INCH Tol.	+0,030	-0,030



consignee : **DART AEROSPACE LTD.**
HAWKESBURY

client: 40980

confirmation # : **59326/900**

purchase order : P030644

AWU article : 50632 /2,600 x ,300 x 103,000 - ,000 I

client article : **D6024-103P**

alloy : EN AW-7075

Int. Alloy No. : 7075

quantity : **45**
length : 2.616,00 MM

gross : 589,000 Kg
net : 471,000 Kg

package id : 129232

piece : 1 case no. : 1

pcs. / length / cast no. / heat no

45x2616,00/4480 - 804615

information : 1 Rohr ungeschlifen als Muster

supplier : Aluminiumwerk Unna AG Uelzener Weg 36 - D-59425

contact : fon +49(0)2303-206- 0 fax +49(0)2303-206-116

date : 29.03.2016



Packinglist ALUnna AG

ALUnna ref. no.	59326/900
Customer PO.	P.O.30644
Date:	03.30.16

Boxmarking:

Dart Aerospace, P.O.30644
D6024 - 103 Made in Germany
Dest. Hawkesbury ONT Canada

We hereby declare that the wooden packing material are totally free from bark and apparently

free from live plant pests

[illegible]

Follow up

Abnahmeprüfzeugnis 3.1 - DIN EN 10204:2005

Inspection Certificate 3.1 - DIN EN 10204:2005 / Certificat de Reception 3.1- DIN EN 10204:2005

Kunde: Dart Aerospace Ltd.
Client:

1270 Aberdeen Street
 K6A1K7 Hawkesbury, ON Canada

Zeugnisnummer: 373/16

Cert No.: / No. du certificat:

Bestellnummer: PO30644

Order No. / No. de commande

Auftrag: 59326/900

Our Reference/Notre Reference:

Produkt: Rohre nahtlos gepresst

Product / Produit: Tubes seamless extruded

Spezifikation: AMS - QQ - A - 200/11A; -

Specification:

Werkstoff: 7075

Alloy/Alliage:

Zustand: T 6511

Temper/Etat

Abmessung: 2,600 INCH x 2,000 INCH x 0,300 INCH x 103,000 INCH

Size / Dimension

D6024-103P

Kennzeichnung: Cert No. 373/16 - ALUnna - 7075 - T6511 - Cast No. 4480 - AMS - QQ - A - 200/11(A) - 2,600" OD X 0.300" Wall - Heat Lot No.

Marking/Marquage: 804615 - ALUnna Order Conf No. 59326/900 - 1 - P.O.30644

Lieferung

Delivered Material / Matériel délivré:

pcs.

lbs

Country of Manufacture: Germany

45

1038

Products are in accordance with applicable RoHS

1. Chemische Analyse

Chemical Analysis / analyse chimique

Charge/ min. Cast No. max.	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Pb	Zr	Bi	Sn	Ni	Na
	0,40	0,50	1,2 2,0	0,30	2,1 2,9	0,18 0,28	5,1 6,1	0,20						
4480/15	0,187	0,187	1,521	0,097	2,573	0,200	5,583	0,037	0,003	0,0174	0,0001	0,0015	0,0050	0,0004

Hydrogen content: 0,12

ccm/100 g Al Elements without indication < 0,01 %

country of melt manufacturer: Germany

2. Mechanische Eigenschaften

Mechanical Properties / Valeurs Mécaniques

Anforderungen Requirements	tensile (Rm) ksi	yield (Rp0,2) ksi	elongation 2" %	elongation A %	Hardness HB	Heat Lot No.
	81,0	73,0	7,0			
1	82,940	74,240	10,0			804615
2	82,650 ✓	73,225 ✓	10,0			
3	81,925	73,225	10,0			

RMS: outside 25 - max. 11,0 µ"

DAS

16

9-89

2010/05/03

**Ergebnis der
Prüfungen:**

Es wird bestätigt, daß die Lieferung geprüft wurde und den Vereinbarungen bei der Bestellannahme entspricht

Test results:

We confirm that the delivery has been tested and applies to the agreements made on receipt of the order

Resultats:

Nous confirmons que la livraison a été contrôlée et correspond avec les conventions faites à la réception de la commande

mergardtri



Certified acc. DIN EN ISO 9001:2008 and DIN EN 9100:2009
 valid until 2016-11-10

Cert.- Req. No.: 001959 QM08; 001959 ASH 09-1

 **ALUnna**

29.03.2016

Aluminiumwerk Unna AG, Uelzener Weg 36, 59425 Unna, Germany

Abnahmebeauftragter

EXTRUSION INSPECTION SHEET



		SIDE A		SIDE B		Measurement unit		Symbol		ULTRA SONIC MEASUREMENTS					
TUBE #	TOTAL LENGTH	DIA		DIA		INSIDE DIA	wall thickness measured w/vern		Strightness at 12" in middle	Rockwell Reading	LOCATION on tube	R1	R2	R3	R4
		R1	R2	R1	R2										
DWG	103"	2.616"				2"	0.308"		0.01"	N/A	Middle	N/A			
1	103"	2.597"	2.6"	2.599"	2.601"	1.992"	0.299"	0.303"	0.003"	N/A	Middle	0.304"	0.3"	0.3"	0.305"
2	103"	2.603"	2.604"	2.603"	2.604"	1.99"	0.303"	0.31"	0.002"	N/A	Middle	0.305"	0.308"	0.307"	0.304"
3	103"	2.6"	2.602"	2.601"	2.6"	1.99"	0.299"	0.307"	0.002"	N/A	Middle	0.3"	0.304"	0.311"	0.307"
4	103"	2.603"	2.604"	2.601"	2.603"	1.993"	0.301"	0.302"	0.002"	N/A	Middle	0.301"	0.309"	0.309"	0.302"
5	103"	2.602"	2.603"	2.601"	2.603"	1.991"	0.3"	0.308"	0.001"	N/A	Middle	0.31"	0.314"	0.298"	0.304"
6	103"	2.601"	2.602"	2.601"	2.603"	1.99"	0.299"	0.305"	0.002"	N/A	Middle	0.297"	0.305"	0.313"	0.303"
7	103"	2.601"	2.599"	2.599"	2.602"	1.99"	0.3"	0.305"	0.002"	N/A	Middle	0.303"	0.305"	0.309"	0.304"
8	103"	2.596"	2.599"	2.595"	2.598"	1.989"	0.295"	0.306"	0.004"	N/A	Middle	0.312"	0.3"	0.299"	0.305"
9	"	"	"	"	"	"	"	"	"	N/A	Middle	"	"	"	"
10	"	"	"	"	"	"	"	"	"	N/A	Middle	"	"	"	"
11	"	"	"	"	"	"	"	"	"	N/A	Middle	"	"	"	"
12	"	"	"	"	"	"	"	"	"	N/A	Middle	"	"	"	"
13	"	"	"	"	"	"	"	"	"	N/A	Middle	"	"	"	"
14	"	"	"	"	"	"	"	"	"	N/A	Middle	"	"	"	"
15	"	"	"	"	"	"	"	"	"	N/A	Middle	"	"	"	"
16	"	"	"	"	"	"	"	"	"	N/A	Middle	"	"	"	"
PART #		P/O#				BATCH #				Notes:					

DAS
16
9-89

2016/05/03

MEAN OUTSIDE DIAMETER PERMISSIBLE ± 0.006 side A									
Tube #	Actual A	Actual B	Mean	Nominal	Tolerance	min allowable dimension	max allowable dimension	Results for min allowable	Results for max allowable
1	2.597	2.600	2.599	0.00	0.006	-0.006	0.006	2.605	2.593
2	2.603	2.604	2.604	0.00	0.006	-0.006	0.006	2.610	2.598
3	2.600	2.602	2.601	0.00	0.006	-0.006	0.006	2.607	2.595
4	2.603	2.604	2.604	0.00	0.006	-0.006	0.006	2.610	2.598
5	2.602	2.603	2.603	0.00	0.006	-0.006	0.006	2.609	2.597
6	2.601	2.602	2.602	0.00	0.006	-0.006	0.006	2.608	2.596
7	2.601	2.599	2.600	0.00	0.006	-0.006	0.006	2.606	2.594
8	2.596	2.599	2.598	0.00	0.006	-0.006	0.006	2.604	2.592

MEAN OUTSIDE DIAMETER PERMISSIBLE ± 0.006 Side B									
Tube #	Actual A	Actual B	Mean	Nominal	Tolerance	min allowable dimension	max allowable dimension	Results for min allowable	Results for max allowable
1	2.599	2.601	2.600	0.00	0.006	-0.006	0.006	2.606	2.594
2	2.603	2.604	2.604	0.00	0.006	-0.006	0.006	2.610	2.598
3	2.601	2.600	2.601	0.00	0.006	-0.006	0.006	2.607	2.595
4	2.601	2.603	2.602	0.00	0.006	-0.006	0.006	2.608	2.596
5	2.601	2.603	2.602	0.00	0.006	-0.006	0.006	2.608	2.596
6	2.601	2.603	2.602	0.00	0.006	-0.006	0.006	2.608	2.596
7	2.599	2.602	2.601	0.00	0.006	-0.006	0.006	2.607	2.595
8	2.595	2.598	2.597	0.00	0.006	-0.006	0.006	2.603	2.591

OUTSIDE DIA. Permissible (with Ovality) ± 0.012 side A							
Tube #	Actual A	Nominal	Tolerance	min allowable dimension	max allowable dimension	Results for min allowable	Results for max allowable
1	2.597	0.000	0.012	-0.012	0.012	2.609	2.585
2	2.603	0.000	0.012	-0.012	0.012	2.615	2.591
3	2.600	0.000	0.012	-0.012	0.012	2.612	2.588
4	2.603	0.000	0.012	-0.012	0.012	2.615	2.591
5	2.602	0.000	0.012	-0.012	0.012	2.614	2.590
6	2.601	0.000	0.012	-0.012	0.012	2.613	2.589
7	2.601	0.000	0.012	-0.012	0.012	2.613	2.589
8	2.596	0.000	0.012	-0.012	0.012	2.608	2.584

OUTSIDE DIA. Permissible (with Ovality) ± 0.012 side b							
Tube #	Actual A	Nominal	Tolerance	min allowable dimension	max allowable dimension	Results for min allowable	Results for max allowable
1	2.599	0.000	0.012	-0.012	0.012	2.611	2.587
2	2.603	0.000	0.012	-0.012	0.012	2.615	2.591
3	2.601	0.000	0.012	-0.012	0.012	2.613	2.589
4	2.601	0.000	0.012	-0.012	0.012	2.613	2.589
5	2.601	0.000	0.012	-0.012	0.012	2.613	2.589
6	2.601	0.000	0.012	-0.012	0.012	2.613	2.589
7	2.599	0.000	0.012	-0.012	0.012	2.611	2.587
8	2.595	0.000	0.012	-0.012	0.012	2.607	2.583

OUTSIDE DIA. Permissible (with Ovality) ± 0.012 side A							
Tube #	Actual B	Nominal	Tolerance	min allowable dimension	max allowable dimension	Results for min allowable	Results for max allowable
1	2.600	0.000	0.012	-0.012	0.012	2.612	2.588
2	2.604	0.000	0.012	-0.012	0.012	2.616	2.592
3	2.602	0.000	0.012	-0.012	0.012	2.614	2.590
4	2.604	0.000	0.012	-0.012	0.012	2.616	2.592
5	2.603	0.000	0.012	-0.012	0.012	2.615	2.591
6	2.602	0.000	0.012	-0.012	0.012	2.614	2.590
7	2.599	0.000	0.012	-0.012	0.012	2.611	2.587
8	2.599	0.000	0.012	-0.012	0.012	2.611	2.587

OUTSIDE DIA. Permissible (with Ovality) ± 0.012 side b							
Tube #	Actual B	Nominal	Tolerance	min allowable dimension	max allowable dimension	Results for min allowable	Results for max allowable
1	2.599	0.000	0.012	-0.012	0.012	2.611	2.587
2	2.603	0.000	0.012	-0.012	0.012	2.615	2.591
3	2.601	0.000	0.012	-0.012	0.012	2.613	2.589
4	2.601	0.000	0.012	-0.012	0.012	2.613	2.589
5	2.601	0.000	0.012	-0.012	0.012	2.613	2.589
6	2.601	0.000	0.012	-0.012	0.012	2.613	2.589
7	2.599	0.000	0.012	-0.012	0.012	2.611	2.587
8	2.595	0.000	0.012	-0.012	0.012	2.607	2.583

end measurement with vern

Mean OUTSIDE DIA. Permissible +/- 0.015									
Tube	Actual A	Actual B	Mean	Nominal	Tolerance	min	max	min	max
1	0.299	0.303	0.301	0.308	0.015	0.293	0.323	0.008	-0.022
2	0.303	0.310	0.307	0.308	0.015	0.293	0.323	0.0135	-0.017
3	0.299	0.307	0.303	0.308	0.015	0.293	0.323	0.01	-0.020
4	0.301	0.302	0.302	0.308	0.015	0.293	0.323	0.0085	-0.022
5	0.300	0.308	0.304	0.308	0.015	0.293	0.323	0.011	-0.019
6	0.299	0.305	0.302	0.308	0.015	0.293	0.323	0.009	-0.021
7	0.300	0.305	0.303	0.308	0.015	0.293	0.323	0.0095	-0.021
8	0.295	0.306	0.301	0.308	0.015	0.293	0.323	0.0075	-0.023

OUTSIDE DIA. Permissible +/- 0.038								
Tube	Actual A	Actual B	Nominal	Tolerance	min	max	min	max
1	0.299	0.303	0.308	0.038	0.270	0.346	0.029	-0.043
2	0.303	0.310	0.308	0.038	0.270	0.346	0.033	-0.036
3	0.299	0.307	0.308	0.038	0.270	0.346	0.029	-0.039
4	0.301	0.302	0.308	0.038	0.270	0.346	0.031	-0.044
5	0.300	0.308	0.308	0.038	0.270	0.346	0.030	-0.038
6	0.299	0.305	0.308	0.038	0.270	0.346	0.029	-0.041
7	0.300	0.305	0.308	0.038	0.270	0.346	0.030	-0.041
8	0.295	0.306	0.308	0.038	0.270	0.346	0.025	-0.040

center measurment with ultra sonic

Mean OUTSIDE DIA. Permissible +- 0.015									
Tube	highest	lowest	Mean	Nominal	Tolerance	min	max	min	max
1	0.305	0.300	0.303	0.308	0.015	0.293	0.323	0.0095	-0.021
2	0.308	0.304	0.306	0.308	0.015	0.293	0.323	0.013	-0.017
3	0.311	0.300	0.306	0.308	0.015	0.293	0.323	0.0125	-0.018
4	0.309	0.301	0.305	0.308	0.015	0.293	0.323	0.012	-0.018
5	0.314	0.298	0.306	0.308	0.015	0.293	0.323	0.013	-0.017
6	0.313	0.297	0.305	0.308	0.015	0.293	0.323	0.012	-0.018
7	0.309	0.303	0.306	0.308	0.015	0.293	0.323	0.013	-0.017
8	0.312	0.299	0.306	0.308	0.015	0.293	0.323	0.0125	-0.018

OUTSIDE DIA. Permissible +- 0.038								
Tube	highest	lowest	Nominal	Tolerance	min	max	min	max
1	0.305	0.300	0.308	0.038	0.270	0.346	0.035	-0.046
2	0.308	0.304	0.308	0.038	0.270	0.346	0.038	-0.042
3	0.311	0.300	0.308	0.038	0.270	0.346	0.041	-0.046
4	0.309	0.301	0.308	0.038	0.270	0.346	0.039	-0.045
5	0.314	0.298	0.308	0.038	0.270	0.346	0.044	-0.048
6	0.313	0.297	0.308	0.038	0.270	0.346	0.043	-0.049
7	0.309	0.303	0.308	0.038	0.270	0.346	0.039	-0.043
8	0.312	0.299	0.308	0.038	0.270	0.346	0.042	-0.047

MATERIAL RECEIPT INSPECTION FORM

MATERIAL: 6024-103
 DATE: 2016/04/28

PO / BATCH NO: PO 30644 / B139410

MATERIAL CERT REC'D: YES
 QUANTITY RECEIVED: 45 PCS
 QUANTITY INSPECTED: 8 + 2 PCS
 QUANTITY REJECTED: _____

THICKNESS ORDERED: SEE ATTACHED EXTRUSION
 THICKNESS RECEIVED: Report
 SHEET SIZE ORDERED: N/A
 SHEET SIZE RECEIVED: N/A

DESCRIPTION	NCR (Check Y/N)		COMMENTS
SURFACE DAMAGE	Y	☒	
CORRECT FINISH	☒	N	
CORROSION	Y	☒	
CORRECT GRAIN DIRECTION	☒	N	
CORRECT MATERIAL	☒	N	
CORRECT THICKNESS	Y	N	SEE ATTACHED EXTRUSION REPORT
PHOTO REQUIRED	Y	☒	
CORRECT MATERIAL	☒	N	AMS - 22-A-200
CORRECT REF # TO LINK CERT	Y	N	PO 30644
CORRECT MATERIAL IDENTIFICATION	Y	N	N/A
CORRECT M# ON THE MATERIAL	Y	N	N/A
DOES THIS MATERIAL REQUIRE ENGINEERING SIGN OFF	Y	☒	
DOES THIS REQUIRE AN EXTRUSION REPORT	☒	N	

CUT SAMPLE PIECE OF MATERIAL AND PREFORM A HARDNESS CHECK. RECORD RESULTS BELOW					
TYPE OF MATERIAL SIZE OF TEST SAMPLE HARDNESS / DUROMETER READING	HRC	HRB	DUR A	DUR D	N/A

testers located in the Quality Office

QC 18 INSPECTION		ENGINEERING SIGNOFF (if required)	
INSPECTED BY: <u>DAS 16</u> DATE: <u>2016/05/02</u>	SIGNED OFF BY: _____ DATE: _____		

Attach this inspection sheet with the corresponding material cert and remit to be scanned and received in

MATERIAL RECEIPT INSPECTION FORM

INSTRUCTIONS FOR INSPECTING BAR, TUBING, ROUND, & SHEET STOCK

- 1- VERIFY STOCK TO DART PURCHASE ORDER
- 2- MEASURE ALL DIMENSIONS FOR EACH PURCHASED STOCK
 - a. WIDTH, THICKNESS, DIAMETER, WALL THICKNESS & LENGTH
- 3- VERIFY CONDITION OF MATERIAL i.e. DAMAGED, CORRODED, etc.
- 4- VERIFY THAT SUPPLIER HAS A NUMBER (HEAT #) ON ITS RECEIVING REPORT TO LINK TO MATERIAL CERTS
- 5- VERIFY MATERIAL CERTS ARE CORRECT TO THE DART PO INSTRUCTIONS
- 6- REMOVE / CUT A PIECE OF MATERIAL FOR SAMPLE HARDNESS TESTING

INSTRUCTIONS FOR INSPECTING SKIDTUBE & STEP EXTRUSION

- 1- VERIFY TO DART SUPPLIED DRAWING
- 2- SAMPLE INSPECT MATERIAL IN BUNDLE TO ENSURE MATERIAL CAN BE RECEIVED INTO DART
- 3- USING PORTABLE HARDNESS TESTER VERIFY HARDNESS OF THE MATERIAL TO THE DRAWING
- 4- VERIFY THAT MATERIAL CERTS MATCH TO WHATS CALLED UP ON THE DART DRAWING

AFTER MATERIAL PASSES INSPECTION

- 5- HAVE DART EMPLOYEES START STOCKING MATERIAL BUT REQUEST MIN **20pcs** FOR FULL INSPECTION
- 6- INSPECT ALL DIMS AS PER DRAWING REQUIREMENTS

INSTRUCTIONS FOR INSPECTING CROSS TUBE MATERIAL

- 1- VERIFY MATERIAL CERTS MATCH THE REQUIREMENTS ON THE DART DRAWINGS
- 2- INSPECT MIN. HALF THE BATCH OF EXTRUSION RECEIVED INTO DART
- 3- INSPECT MATERIAL AS PER THE EXTRUSION REPORT
 - a. WALL THICKNESS USING ULTRA-SONIC IN 4 LOCATIONS
 - b. OUTSIDE DIAMETER HIGHEST/LOWEST BOTH ENDS
 - c. INSIDE DIAMETER HIGHEST/LOWEST BOTH ENDS
 - d. STRAIGHTNESS @ CENTER OVER 12" SPAN
 - e. WALL THICKNESS USING TUBE MICROMETER HIGHEST/LOWEST BOTH ENDS
- 4- IDENTIFY EACH TUBE IN SEQUENCE OF INSPECTING (TUBE 1, TUBE2.....) AND W/O# AND PO#
- 5- RECORD ALL FINDINGS ON EXTRUSION REPORT

IF ANY QUESTIONS PLEASE SEE QC COORDINATOR BEFORE GOING FURTHER